AMENDMENTS TO THE CLAIMS

1. (previously presented) A method of pre-treating a barrier metal layer of a partially finished integrated circuit device prior to the deposition of a copper film thereon, comprising the steps of:

providing a partially finished integrated circuit device including a barrier metal layer;

subjecting said barrier metal layer to a non-plasma atmosphere chosen from the group consisting of: an ambient vacuum, hydrogen gas, argon gas and helium gas;

subjecting said barrier metal layer to a temperature greater than 200 degrees Celsius for at least thirty seconds to form a pre-treated barrier metal layer; and

depositing a copper film on said pre-treated barrier metal layer.

2. (original) The method of claim 1 wherein said step of subjecting said barrier metal layer to a temperature comprises subjecting the barrier metal layer to a temperature in a range of 250 to 550 degrees Celsius.

3. Cancelled.

4. (original) The method of claim 1, prior to depositing said copper film on said pre-treated barrier metal layer, further comprising the step of subjecting said barrier metal layer to a pressure in a range of 0.1 mTorr to 20 Torr.

5. (original) The method of claim 1, wherein said barrier metal layer is subjected to a temperature greater than 200 degrees for 30 to 100 seconds.

6. (original) The method of claim 1 wherein said barrier metal layer comprises a trench having a side wall, a bottom surface, and a width of 0.13μm or less, and wherein said copper film is deposited by chemical vapor deposition throughout said trench and against said side wall and said bottom surface.

7. (original) The method of claim 1 wherein said copper film deposited on said pre-treated barrier metal layer has adhesion properties such that said copper film remains adhered to said pre-treated barrier metal layer when said copper film is subjected to a tape test.

8. (original) The method of claim 1 wherein said barrier metal layer is chosen from the group consisting of TiN and TaN.

9. (currently amended) A method of pre-treating a barrier metal layer of a partially finished integrated circuit device for the deposition of a copper film thereon, comprising the steps of:

providing a partially finished integrated circuit device including a barrier metal layer having a trench therein;

subjecting said barrier metal layer to a temperature greater than 200 degrees Celsius for at least thirty seconds in ~~an~~ a non-plasma atmosphere chosen

from th group consisting of: an ambient vacuum, Hydrogen gas, Argon gas, and Helium gas to form a pre-treated barrier metal layer; and

thereafter depositing a copper film on said pre-treated barrier metal layer and throughout said trench,

wherein said barrier metal layer comprises TiN.

10. (original) The method of claim 9, simultaneous to subjecting said barrier metal layer to said atmosphere, further comprising the step of subjecting said barrier metal layer to a pressure in a range of 0.1 mTorr to 20 Torr.

11. (original) The method of claim 9 wherein said trench has a width of 0.13μm or less.

12. (original) The method of claim 9 wherein said copper film deposited on said pre-treated barrier metal layer has adhesion properties such that said copper film remains adhered to said pre-treated barrier metal layer when said copper film is subjected to a tape test, and wherein said copper film has uniform properties there through.

13-20. Cancelled.

21. (previously presented) A method of pre-treating a barrier metal layer of a partially finished integrated circuit device prior to the deposition of a copp r film thereon, comprising the st ps of:

providing a partially finished integrated circuit device including a barrier metal layer;

subjecting said barrier metal layer to a temperature greater than 200 degrees Celsius, while said barrier metal layer is subjected to a non-reactive atmosphere, for at least thirty seconds to form a pre-treated barrier metal layer; and

depositing a copper film on said pre-treated barrier metal layer.

end

22. (currently amended) The method of claim 21 wherein said non-reactive atmosphere is chosen from the group consisting ~~essentially~~ of: an ambient vacuum, hydrogen gas, argon gas and helium gas.